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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,764	04/06/2001	Gang Liu	0118-00101	7361

7390
01/30/2003
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EXAMINER

MENEFEE, JAMES A

ART UNIT PAPER NUMBER

2828

DATE MAILED: 01/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/827,764

Applicant(s)

LIU, GANG

Examiner

James A. Menefee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Paul IP
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TECHNOLOGY CENTER 2800

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 31 October 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Response to Amendment

In response to the amendment filed 31 October 2002, the specification and claims 1, 2, 4 and 12-14 are amended. Claims 1-14 are pending.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing or post office address of each inventor. A mailing or post office address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing or post office address should include the ZIP Code designation. The mailing or post office address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

It does not identify the citizenship of each inventor.

Applicant has not given a post office address anywhere in the application papers as required by 37 CFR 1.33(a), which was in effect at the time of filing of the oath or declaration. A statement over applicant's signature providing a complete post office address is required.

Drawings

The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 31 October 2002 have been approved. A proper drawing correction or corrected drawings are

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required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

The Patent and Trademark Office no longer makes drawing changes. See 1017 O.G. 4.

It is applicant's responsibility to ensure that the drawings are corrected. Corrections must be made in accordance with the instructions below.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.185(a). Failure to take corrective action within the set (or extended) period will result in **ABANDONMENT** of the application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 8 recites the limitation "said host microprocessor" in line 7. There is insufficient antecedent basis for this limitation in the claim. The microprocessor on the circuit board should be introduced originally as a host microprocessor.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Pfaff (US 6,292,498).

Pfaff discloses a laser driver for generating coherent light comprising at least two laser diodes 32 mounted in combination with a thermoelectric temperature control means 34, and a

microprocessor 50 for controlling and/or monitoring said laser diodes and said thermoelectric temperature control means. As the at least two laser diodes are a laser diode bar or array, it is inherent that they can be operable to simultaneously provide laser beams. See Fig. 1, and col. 2 line 66 – col. 4 line 8.

Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by Sprague et al. (US 5,138,340). Sprague discloses a method of controlling a laser diode comprising activating a control circuit including a laser diode at a current below the laser activation threshold, increasing the current above the laser activation threshold to activate the laser, and reducing the current below the laser activation threshold to deactivate the laser (abstract).

Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Rudd et al. (US 5,821,527). Rudd discloses a laser diode control circuit including a p-channel MOSFET connected to the power input of said circuit. The claimed property, that the MOSFET allows the pre-selected input power polarity to pass and turns off if the opposite polarity is received, is inherent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freitag et al. (previously cited US 5,999,549) in view of Jabr (previously cited US 5,594,748), and further in view of Noda et al. (previously cited US 6,229,833).

Regarding claim 2, Freitag discloses a method of controlling/monitoring a laser diode comprising power safety parameters, monitoring the power safety parameters during operation of the laser diode, and disabling the laser diode if the power safety parameters are exceeded (detailed description). It is not disclosed that the system includes a microprocessor and that power safety parameters are stored in a memory of a microprocessor. Jabr teaches a laser driver system where a microprocessor controls the driving of a laser and also stores in memory limits for parameters of the laser diode, that when passed, would cause failure of the operation of the laser (abstract). It would have been obvious to one skilled in the art to include a microprocessor and to store the limits of the parameters in memory of the microprocessor because the microprocessor can control the entire system, and the microprocessor must know when to shut down the laser or sound an alarm, and therefore should know when parameters of laser operation are exceeded, as taught by Jabr. It is not disclosed that the monitoring is continuous. Noda teaches in Fig. 1 a laser protection circuit having a comparator that compares the current through the laser to a predetermined current, and disables the current to the laser when the current exceeds the predetermined current (col. 7 lines 5-55). It would have been obvious to one skilled in the art to include such a part so that the laser diode is not damaged by the excessive current, as taught by Noda. Monitoring by the comparator will be continuous.

Regarding claim 3, it is inherent that the operation of the laser diode may be re-enabled upon the occurrence of a predetermined contingency, i.e. when the cause of the fault is no longer present.

Regarding claim 4, Freitag discloses that the safety parameters may be output power and pulse duration (col. 3 lines 25-39).

Regarding claims 5-6, it is inherent that that microprocessor would record the output power and the laser pulse start and stop times, as these are the parameters that are being measured.

Regarding claim 7, it is not disclosed that the microprocessor extrapolates a curve based on the parameters stored in the memory for determining the parameter limits. It is well known that microprocessors may extrapolate a curve using previously known points. It would have been obvious to one skilled in the art that this microprocessor may do so should the parameter limits not be previously given, so that the microprocessor will know what values the parameters may be for proper operation, as is known.

Regarding claim 13, Freitag and Jabr teach as in the rejection of claims 2-7 above a laser driver control system comprising a laser diode and a computer monitoring the pulse frequency and duration of the laser diode and means to disable the laser diode if predetermined values are exceeded. There is not taught a comparator for continuously measuring the current through the laser diode and comparing it to a predetermined current, and disabling the system if the current exceeds the predetermined value. Noda teaches in Fig. 1 a laser protection circuit having a comparator that compares the current through the laser to a predetermined current, and disables the current to the laser when the current exceeds the predetermined current (col. 7 lines 5-55). It

would have been obvious to one skilled in the art to include such a part so that the laser diode is not damaged by the excessive current, as taught by Noda. There is further not taught a power control loop including the parts of the driver control system where the microprocessor verifies the operation of the components and disables the laser if any components are not operating. It is well known to disable a laser if it is found that the parts are not operating. It would have been obvious to one skilled in the art to disable the laser if the parts are not operating so as not to damage the laser and its components, as is well known.

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. (previously cited US 5,872,624) in view of Underwood, Jr. et al. (US 5,816,535).

Regarding claim 8, Chambers discloses a laser driver control system comprising a microprocessor 50, at least one laser driver 20 and a corresponding laser diode 15A. It is not disclosed that the parts are on a printed circuit board or that there is a serial communication between the microprocessor and laser driver. There is also not disclosed a second, remote microprocessor. Examiner takes Official Notice that it is well known to place parts of a circuit on a printed circuit board. It would have been obvious to one skilled in the art to include all of the items of the driver control system on a printed circuit board because then all of the parts are organized together, power may be provided to all parts at the same time, and communication between the parts is more easily accomplished than if they were on separate boards, as is well known. While a serial communication between microprocessor and laser driver is not disclosed, it is well known that such communication may be serial, and it would have been obvious to one skilled in the art to make such a serial communication because then the communication is

provided directly from the processor to the driver, as opposed to a parallel connection, as is well known. Underwood teaches circuitry having two microprocessors (col. 5 lines 41-61). It would have been obvious to one skilled in the art to include a second microprocessor in Chambers' system, because the second microprocessor may be used as a backup in the instance that the first microprocessor fails, as taught by Underwood. While one may argue that Underwood is non-analogous art, since it is not at all related to a laser control system, Underwood does disclose circuitry comprising a microprocessor, and teaches a way to improve a circuit having a microprocessor. As Chambers' system includes a microprocessor, one skilled in the art would look for ways to improve a system with a microprocessor, and therefore would look to Underwood.

Regarding claims 9-10, Chambers discloses a TEC, but not a heat sink connected to the TEC. Examiner takes Official Notice that it is well known to include a heat sink with a TEC in laser diode driver type systems because the heat sink will work in conjunction with the TEC in order to accomplish the goal of stabilizing the temperature, as is well known.

Regarding claim 11, Chambers discloses a plurality of laser diodes, but not a plurality of drivers. It would have been obvious to include a plurality of drivers rather than the single driver if one wanted to control each of the plurality of laser diodes independently, as is well known.

Response to Arguments

Applicant's arguments with respect to claims 1-3 and 5-12 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to claim 4 are not persuasive. Applicant states that the present invention differs from Freitag because Freitag does not monitor pulse duration "during pulsed mode laser operation". The Examiner disagrees. Even if Freitag is measuring the abnormal pulse, i.e. the fault condition, as asserted by the applicant, the fact there is a pulse shows that the laser is running in pulse mode.

Applicant's arguments with respect to claim 13 are not persuasive. Applicant states that continuous monitoring is not taught. However, the obvious addition of the comparator as deemed obvious in view of Noda will provide continuous monitoring.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
January 15, 2003


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